

Case story | VACON® 100

Energy savings – the big feature at the cinema

One of the UK's largest and most progressive operators of multiplex cinemas is seeing large energy and cost savings following the installation of VACON® 100 FLOW and VACON® 100 X AC variable speed drives (VSDs) at 68 of its sites. The drives, which were specified and installed by e-efficient Energy, an expert in energy saving and the technical leader in voltage optimisation plus regulation, are being used to provide enhanced control of the air-handling units (AHUs) at the cinemas.

While carrying out work on another project for the cinema operator, a company with which it has a longstanding relationship, e-efficient Energy became aware of the potential

for improving the energy efficiency of the cinema AHUs. At that time, the motors in the AHUs were controlled by pressure differential switches and signals from the building management system (BMS). This arrangement meant that the motors were either stopped or running at full speed – no intermediate level of control was possible.

The engineers at e-efficient Energy knew that fitting VSDs would allow much better control, and would mean that the motors could be operated below their maximum speed almost all the time, since the full capacity of AHUs is typically only needed on a very few hot days in summer. Given that the energy used by a motor in this type of application is approximately

proportional to the cube of its speed, the potential for energy savings is very large. If the motor speed is reduced by just 10%, for example, its energy consumption falls by almost 30%. VACON® 100 FLOW meets key requirements

In choosing the most suitable VSDs for this application, the e-efficient Energy engineers had to take into account a number of key requirements. The drives needed to be reliable and easy to use, yet offer good value for money. They also had to be compact, since on many of the sites the space available was very limited, as well as suitable for installation without needing an enclosure or any other form of additional protection.



Having previously had excellent experiences of working with Vacon and its products, the e-efficient Energy engineers quickly decided that VACON® 100 FLOW drives would offer the best solution for the cinema project.

Wide range of standard application-specific features

Specifically developed for fan and pump applications, the VACON® 100 FLOW drives provide a wide range of application-specific features as standard, including dual-zone PID control, a real-time clock, and integrated Ethernet and RS485 ports, to facilitate communication with BMS

"This has been a very successful project and our client is delighted with the results. Across the UK, they have cut their energy usage by around 12% as a result of the work we've carried out for them, which includes fitting the VACON® VSDs. This works out at savings of £1.2 million (EUR 1.5 million) a year. It's not hard to see why our client sees this work as such a good investment!"

Craig Needham, Managing Director of e-efficient Energy

installations and other supervisory systems. The drives also support other popular communication protocols with inexpensive plug-in option cards.

A start-up wizard and quick setup mode make it easy for users of VACON® 100 FLOW drives to select relevant operating parameters and monitoring values, while unique application menus guide them through a quick and easy commissioning process. Built-in block programming facilities mean that the drives can be readily tailored to suit special requirements, a feature that is particularly useful in retrofit applications like this one.

The drives also have a compact construction, a key requirement for the cinema application, and they are available in IP66 versions suitable for installation without additional protection even out of doors. A further bonus is that they use thin film capacitors rather than the more common electrolytic types, which enhances their reliability and extends their working lives.

e-efficient Energy has now installed VACON® 100 FLOW and VACON® 100 X drives at all 68 of the cinema operator's sites in the UK, with an average of 16

drives being required per site. In all cases, installation and commissioning proved to be straightforward, and the drives are operating faultlessly. The drives operate on a 40 Hz reduction, based on airflow for the gas control valves.

Good investment

At the same time as installing the drives, e-efficient Energy also implemented other energy saving measures at the cinemas, including voltage management. This makes it impossible to quantify the savings that can be attributed to the drives alone. An automatic monitoring system installed at one of the cinemas, gives a good indication of the overall results.

This case story was originally released before the merger of Vacon and Danfoss Power Electronics was fully completed on 15 May 2015. As a result, Vacon as a company brand no longer exists and contact persons mentioned in the story may have changed. Future case stories on VACON® products will be released on behalf of the new organization – Danfoss Drives – which is part of the Danfoss Group.



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